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DOCUMENT SERIALS, TECHNICAL REPORTS, AND THE NATIONAL BIBLIOGRAPHY

Bibliographically, document serials do not differ substantially from other serials. Their acquisition is largely dependent upon the use of enumerative bibliographies which identify them; their use, upon the subject bibliographies which give some measure of control over their contents. Based on local requirements, every library has its own problems to consider—storage, convenient availability, paper quality—but bibliographic access is the common need that they all share. If libraries are willing to accept Osborn's definition that "on practical grounds a serial can be defined as any item which lends itself to serial treatment in a library,"[1] then a great bulk of government document publication falls into the province of this conference. One reasonable estimate, based on a university library's receipts of documents, is that "80 percent of the material published by the United States government is serial in nature."[2] It is safe to assume that a comparable percentage pertains in most large libraries for state and foreign government acquisition.

While today there are many bibliographic aids for serials and for documents that were not available a few years ago, the acquisition librarian's and the serial records librarian's approach to document serials—whether for serial titles or for individual issues—is often far from direct or automatic. Librarians are fortunate to have *New Serial Titles* from 1950, which gives far better coverage of state, federal, and foreign documents than the *Union List Serials* did, but as with any cooperative compilation, librarians must be grateful for what they find, and philosophic about what they do not find.

The array of national bibliographies outside the United States which includes documents is impressive; and to use them well, keenness of mind, persistence of spirit, unflagging good humor, and great flexibility are needed.

For example, librarians must know that the *Indian National Bibliography* puts its documents in a separate section with its own index; the Soviet Union's *Knizhnaia Letopis'* includes ministry publications in the main issues, except for a few which go into a separate "Dopolnitel'nyi vypusk"; and that the *British National Bibliography* includes "certain government publications," with specific omissions which must be compensated for elsewhere. And so it goes for all the national bibliographies of which document entries must somehow be a part. In enumerating state publications, the simple virtues called for above must be enhanced by immeasurable patience and prodigious resilience in the face of frustration. The *Monthly Checklist of State Documents* is a dependable guide and an indispensable instrument for many purposes, but it is somewhat reminiscent of Carrie Nation's epitaph: "She did what she could."

These difficulties are pointed out, not to deprecate the works at hand but simply to remark the special problems of document serials. The titles of many document periodicals are included in the standard bibliographies of serials, such as *Ulrich's International Periodical Directory.* Some national bibliographies also list separate issues of both government and non-government periodicals, and of other kinds of serial publications (for example the *Deutsche Bibliographie: Zeitschriften-Verzeichnis* and *Letopis' Periodicheskikh Izdanii SSSR).* Unfortunately, we do not have this kind of a detailed bibliography in the United States for periodicals. The official bibliographies for documents are not necessarily the most economical sources for identifying government serials, because they are nearly always incomplete or partial. In our own national documents bibliography, the Government Printing Office's Price List no. 36 for "Government Periodicals and Subscription Services" is convenient, but omits many non-periodical serials; the annual "Directory of United States Government Periodicals" in the February issue of *Monthly Catalog* is helpful, but admittedly incomplete, and we are better served by Andriot's *Guide to U. S. Government Serials and Periodicals.*[3] Many document serial titles and their individual issues do not get into the *Monthly Catalog* because the Superintendent of Documents never receives a copy. This situation is not peculiar to United States document bibliography. In writing about British documents, N. G. Thompson has said:

> It has often been urged upon H.M.S.O. that it should catalogue all official material whether it publishes it or not, but whatever the distant future may hold, there is no foreseeable prospect of this Herculean–and costly–task being undertaken. The Stationery Office is equipped to do no more than catalogue what it publishes itself (some 6,000 titles a year) and the creation of a centralised cataloguing unit for material not actually published by it would present formidable administrative difficulties. This means in practice that the user of non-H.M.S.O. material must perforce turn to the individual departments and other official organizations for information and supply.[4]

So it is with other document bibliography everywhere, and so it is likely to continue to be.

The United States has tried to cope with the situation cooperatively by means of the Documents Expediting Project for non-GPO publications. By

1968, there were 142 subscribers to that Project; they received some 241,000 items. During the previous year the subscribers received "214,000 items through established channels; an additional 48,000 items were sent in response to 11,323 individual requests. Of these requests 85 percent were filled by supplying the wanted material and two percent by providing information as to the source of supply."[5] But even so, most librarians have had to pay close attention to areas of special interest and to use such wits as they have at their command to assure completeness of serial files. Even with close attention, a naturally acquisitive instinct, and a degree of clairvoyance, some librarians will have failed to complete files of such series as *Technical Memoranda* of the Waterways Experiment Station, or the *Circulars* of the U. S. Geological Survey. For serials of this sort, borrowing issues to film for collections or getting copies from personal acquaintances must often be resorted to. Ultimately, librarians live with some incomplete files; this is true for all serials but is especially apparent in irregular document serials.

The acquisition of state serial publications tends to be even more trying. In some fields the distribution is regular enough—engineering experiment stations, geological surveys, and most agricultural experiment stations. Agencies with a tradition of having their publications abstracted widely by standard services usually either accept standing orders or maintain publication announcement lists. But many state bureaus and offices do not have regular distribution programs and are not responsive to requests for regular serial distribution or for individual issues. Important as these publications are to libraries, they apparently do not seem so to the offices responsible for their preparation. Some of the distribution is on the basis of regular mailing lists; some on the basis of exchange agreements between libraries; and some apparently on the basis of an individual's memory or disposition. Research libraries should take an initiative in this area and introduce a plan for general access. This might take the form of a central collecting agency for state documents, supported by member institutions or by state governments, from which copies—either as film or photocopy—could be readily obtained. Money for such an enterprise would undoubtedly be hard to come by, but it should be possible to demonstrate that future economies would be enjoyed. Or a plan for centralization might take the form of depository collections in state libraries, which would then have a definite responsibility to compile monthly lists of all documents acquired. Such lists could be incorporated into the *Monthly Checklist,* making it a comprehensive union list showing locations for items listed. Use would depend upon good bibliography and upon the state libraries' efficient and prompt filling of request. If each state government had a sales agent for all state publications, even the higher prices necessitated by having a centralized distribution agency would be an ultimate economy to most libraries. We undoubtedly need some good studies of use of state documents, of present methods of acquisition, of current library policies, and of state laws relating to deposit or to distribution. Imposing effective bibliographic control, in the light of fair measurements of library need, is our greatest task here. If this were done, together with cooperating depositories, state documents could be much more effectively exploited.

In part because of the acquisition difficulties attendant upon the mandatory use of a multitude of catalog lists and publication notes, it has been written frequently in library literature that a separate documents collection is desirable. Like King Charles's head, the question of separate versus incorporated documents collections keeps re-appearing. For each library, the question (if there is one—some would doubt it) must be resolved by a rational compromise which would result in both a useful and an economical solution. Most government serials should be treated like other serials with title entries in the appropriate records (serials records or card catalog) and with dependence upon standard abstracts and indexes for analytics. If a serial publication of a government agency is regularly analyzed in *Engineering Index* or in *Abstracts of North American Geology*, it is wasteful to make analytics in the library's card catalog. If a library's holdings of abstracts and indexes are inadequate for this approach, decisions must be made about either adding more abstracts or selectively analyzing certain publications in the library. Usually, when appropriate abstracts are available, they will be the more economical choice. Some series—*The Bibliography on Snow, Ice and Permafrost* is an example—need full cataloging. In many cases, foreign document serials will require treatment different from that given domestic publications, again depending on available abstracts and the languages in which they are published.

Once a serial has been appraised in terms of subject access, and the serial has then been appropriately treated, its location in the documents collection, the serials collection, or some other departmental collection is of lesser importance. If an administrative economy can be effected by a separate document collection, it may be well to do so; if the library's public will be better served by integrating the serial with a subject collection, this may be the best choice. But the basis for these decisions must first be a careful appraisal of subject access to the contents of the serial, and only secondly the convenience to library administration.

In evaluating subject approach to document serials, treatment of them by the national bibliography should be of paramount significance. It our own case, the most frequently used of the national document bibliographies is the *Monthly Catalog of United States Government Publications.* Especially since the death of the *Documents Catalog* anguished and unremitting appeals for an all-inclusive monthly catalog listing both GPO and non-GPO publications have been heard. In some instances, the coverage of non-GPO publications has been improved in recent years, and chances of finding the successive numbers of serial publications are considerably better than they once were. But the likelihood of the *Monthly Catalog's* achieving a really comprehensive enumeration of all U.S. government publications is remote. There are many good departmental lists issued, as well as some comprehensive departmental indexes. Examples of these are the Geological Survey and the National Bureau of Standards. The numbers of such lists, the knowledge of their existence and the ability to use them may seem to put a burden on the acquisitions and the reference staff, but this is less of a burden than a simple professional responsibility. To hope for a *Monthly Catalog* which contains all publications

issued by governmental agencies is bibliographically unrealistic. Librarians can be grateful for improved coverage, but should not waste time and effort hoping for the improbable. They should settle instead for the careful enumeration of all those items which now come to the attention of the Superintendent of Documents.

They should not, however, settle for the woeful inadequacy of the *Monthly Catalog's* index. As a subject approach to major segments of the federal publishing program, the *Monthly Catalog's* index is inefficient and ineffective in the hands of all but the fully initiated and experienced. It may be possible to train library staff, even faculty and research personnel to use the *Monthly Catalog* with a degree of certainty, but if they do so, they will be joining an almost incredibly exclusive club. The subjects entries are often made up from the individual titles at hand rather than from a standard and consistent list. The index seems to make use of the basic technique of the permuted title index, but fails to make up for the deficiencies of that device, because it rings only one change on the title. For example, if one sought the Weinberg Report published in 1963 under the title *Science, Government and Information: The Responsibilities of the Technical Community and the Government in the Transfer of Information; A Report,* he had only one chance. Under "Science" as a subject one must go to the fifth substantive work of the subtitle (which one almost certainly does not have in his reference) and arrive at ". . . Transfer of Information, Responsibilities of Technical Community and Government." As subject indexing this puts a burden of incredible persistence on the user. Most of us, of course, would simply go to *PAIS* and find it under Weinberg (whose name is not in the *Monthly Catalog* index) or under "Science and state" or "Scientific information."

Improving the index so that one could have reasonable expectations when he used it as a key to the materials listed in the *Monthly Catalog* could offer considerable economies to libraries in organization of its material. If the *Monthly Catalog* index could be brought into the mainstream of national bibliographic coverage with adequate subject headings and corporate author entries, its usefulness would be far greater, its reference function would be more available to all research workers, and document serials would be susceptible to the same reference use and control as are other serials. By using such bibliographies as *Engineering Index, Bibliography of Agriculture, Chemical Abstracts,* and *PAIS* it is possible to achieve this to some degree now. (The indexing policy that died when *Agricultural Index* changed its title was a severe blow in this respect. For libraries which have *Biological Abstracts* and *Bibliography of Agriculture,* the new *Biological and Agricultural Index* is now an expensive luxury. When it stopped indexing Agriculture Department, experiment station, and extension service publications, it forfeited its claim to real usefulness in research libraries.)

An improved index would make the *Monthly Catalog* less an instrument for the documents specialists alone. And here lies another of the major lapses in use of government serials. While all serials seem formidable to some librarians, documents sometimes seem to be totally unapproachable, if not

downright evil to them. The librarian who takes this point of view does so at his peril, and so does the library school student who is seriously undertaking professional training. There are undoubtedly many reasons for this; it would scarcely be surprising to be told that a deep distaste for documents is ingested by the child with his mother's milk. It seems more likely, however, that three factors play significant roles in the popular view that documents are fugitive and difficult to use. The first is their sheer bulk and here we are helpless. The second is the inadequacy of indexing in the *Monthly Catalog*. The third is the isolation of document training in library schools. Library school curriculum committees should give serious consideration to the liquidation of courses in government documents. The content of those courses should be absorbed into other major subject areas of the curriculum—the basic bibliography of documents belongs in the study of national bibliography generally, related to it and recognized as a major part of it. The study of bibliographic access to the document literature of political science, of statistics, of economics, of international affairs belongs in the course on the literature of the social sciences. The study of the document literature of natural and physical sciences, of engineering, of medicine and public health belongs in the course on literature of the sciences and technology. Consideration of the organization of document serials belongs in the courses on administration and cataloging. Their acquisition should be studied along with the selection of other library materials. The emphasis on documents should be to put them into the mainstream of bibliography and source materials, not to put them into quarantine in a course by themselves. Such a curriculum change would charge all instructors with giving instruction in documents, but this asks no more than that they know the literature of their subjects.

A library's document serials must be related to its serials in general, and within that context the"technical report" must also be related to scientific communication in general. To determine its collecting policies, its treatment of, and its reference responsibilities for technical reports, a library must try to see the place of the technical report in contemporary scientific literature. There is no uniform criterion for judging the significance of report literature. No two libraries will find their needs quite comparable. Scientists' attitudes toward report literature also differ from one discipline to another; generally their points of view depend upon their interest in basic science as opposed to its applications in technology.

One technical report, concerned with the role of the report in scientific and technological communication, has an appendix headed "Taxonomy of the Technical Report Literature."[6] The following descriptions of the principal types of technical reports are based largely on that summary and make use of its terminology to identify them. They are:

1. The individual author's "preprint," or processed manuscript, intended primarily for circulation among colleagues for review or comment. But these materials may also be distributed with a more formal designation, as in the Rand Corporation Papers designated as "P's," which do not represent corporate studies. Even though informally presented and distributed, they are likely to be cited or indexed. They also may be published subsequently in a journal,

but meanwhile they are in the literature and the abstracts with their first series designation–or designations, for often they are assigned series numbers by more than one agency.

2. The contract "progress report," thought to be "the most populous species of technical report in circulation." These progress reports are designed to give the sponsor periodic assessments of progress under the contract. They are also often distributed to others working in related problem areas. It is estimated that these quarterly reports (even monthly for some contracts) now number in the millions. In many cases their contents will be included or summarized in the final reports of the projects, but in some instances this is not so. It sometimes happens that the data included in the progress reports are referred to but not included in the final report.

3. The "final report" on a technical contract effort, rated "as probably the most valuable specimen in the collection." This is so in part because the final report is written with the editorial support and review of the research group of the institution as a whole. The quality and scope of such reports are widely varied, and differences in form, serial designations, distribution, and indexing can strain credulity.

4. The "separate," topical technical reports, which come closest in style and form to journal articles. These may be requested by sponsors, or may result from the researcher's simply wanting to be heard. Often they are also submitted to journals, where they are likely to appear in more carefully edited, abbreviated form. Some institutions may also give these reports, in reprint, a serial code of their own, put their own covers on them, and issue them in still another bibliographic dress.

5. The "book" in report form, likely to be a review, or survey of the state-of-the-art. Special information centers, AEC and NASA for example, generate reports of this nature, and so do such organizations as industrial laboratories.

6. Committee-type reports, which can arise from scientific advisory committees presenting their conclusions and supporting data in report format. These include Advisory Committee Reports to the President, National Academy of Science Reports, special commission reports, and so on.

These reports, with their great variation of stylistic quality, their variation from informal to institutionally refereed, also share some common characteristics. They are primarily concerned with the applied sciences–e.g., engineering, medicine, agriculture, computer technology. Often they are useful primarily because of the data which they include, and literature citations to them frequently derive from their providing an authority for such data. Arising, as they usually do, from projects having specific goals, they are strongly user-oriented and frequently concerned with use and exploitation of the techniques described. While we tend to think of technical reports as a government publication device, they are not exclusively so; their form and mode of distribution have been widely used in industry for many years. They are generally characterized by the purpose of fulfilling some sort of contractual obligation. It is estimated that "some half a million items per year fall into this technical report category."[7]

With so large and so various a body of materials, there can be no pat appraisal of its place in the literature of science and technology. But a summary of the usual forms of scientific literature may be useful to us in attempting to evaluate the technical report. Traditionally, in the western world at least, the literature of the sciences has from the first depended upon the organization of scientific societies. The academies of France and Italy, and the Royal Society of London provided for the gathering of men with inquiring minds, and then for the exchange of information through prompt journal publication. The *Philosophical Transactions* and the *Journal des Scavans* were a forum for scientific exchange and provided the prototype for what can now be called classical scientific publication. Journals grew in number, continuing for many years to be sponsored primarily by academies and professional societies. Their contents were, and are, carefully refereed; articles are edited for style and accuracy. This now also applies to many commercially published journals which have boards of editors acting as referees.

In addition to these scientific journals, there are trade journals which are more concerned with applications than with scientific discovery, and other serials reporting the work of projects, expeditions, and institutional studies. The *Monographs* and *Bulletins* of the U.S. Geological Survey are good examples of this form. The individual review or monographic study is also characteristic of scientific publications whether issued serially or independently; the many series of "Advances. . ." are examples of separate review volumes.

The scientific meeting which preceded these printed means of communication has been a significant vehicle for the exchange of information. To the bibliographer, the classical "International Congress" has now become an almost virulent form on both national and international levels and presents myriad problems of its own in connection with preprints, published proceedings, unpublished papers, reprints, and variations in meeting names. Beyond these more or less traditional forms of communication, there is also the important factor of direct personal communication, and this too is a venerable tradition. In the seventeenth century, before the Royal Society was founded, scientists met in London and called themselves the "Invisible College," a name which distinguished them from the visible Gresham College. A few years ago what were called "New Invisible Colleges," are simply called today the "invisible colleges," without the distinction of capital initial letters. These have been well defined by Derek J. de Solla Price:

> In each really active field of science today there is now in being something which we call the "New Invisible Colleges"—the group of everybody who is anybody in the field at that segment of the research front; an unofficial establishment based on fiercely competitive scientific excellence. They send each other duplicated preprints of papers yet to be published, and for big things they telephone and telegraph in advance. . . . By substituting the technology of transportation for that of publication they keep warm the seats of jet-planes and commune with each other at small select conferences and seminars throughout the world.[8]

Taken as a whole, journals and serials published as reports on exploration or experimental research, proceedings of conferences and symposia, and some research monographs comprise what has been called the "canonical" literature of the sciences, to make use of a term attributed to F. J. Weyl.[9] The rapid exchange of information in increasingly limited fields, as it is accomplished in the invisible colleges, simply brings the canonical form full circle.

Outside this canon lies the technical report, which is essentially a product of this century and has achieved, one hopes, its ultimate proliferation in the past thirty years. To the scientist or bibliographer who feels closely identified with traditional journal literature, the technical report is a bastard form—recklessly conceived, unattended at delivery, too often unregistered as a legitimate vital statistic, and either lacking a family name or having too many from which to choose. Thus it appears to be an unproper part of the scientific archive, but to research and development workers, who make up a large part of the population in technical libraries, the report is quite something else. It can provide such a worker with a prompt and timely announcement of significant technical developments (if he is on a distribution list and need not wait indexing or abstracting); it usually provides a comprehensive treatment of an application; it is more likely to include negative results than is a journal article; and its contents, if useful to him at all, can often be immediately exploited by the research and development worker. As a result reports are thus referred to in bibliographies, they are abstracted in discipline-oriented abstracts as well as in their own mission-oriented bibliographies; having been cited in papers, they are referred to in *Science Citation Abstracts;* and they are advertised for sale by the Clearinghouse for Federal Scientific and Technical Information which announces around 30,000 copies of them annually. Authors of a recent article on the source literature of plasma physics speculate on the possiblity that "there may exist a sub-culture of authors who read and cite reports."[10] In spite of what may be distaste for or ambivalence about them, librarians are forced to recognize that they are a persistent element in the exchange of technological information. As the Weinberg Report noted in 1963:

> The documentation community has taken an equivocal attitude toward informal reports; in some cases the existence of these reports is acknowledged and their content abstracted in the abstracting journals. In other cases informal reports are given no status; they are alleged to be not worth retaining as part of the permanent record unless their contents finally appear in a standard hard-copy journal. Whether this position is tenable even in the basic sciences is open to question; it certainly is no longer tenable in technological development.[11]

There is also widespread attention and interest in these reports on an international level. A.I. Mikhailov and his colleagues at the All-Union Institute of Scientific and Technical Information (VINITI) in Moscow issued a second edition of their work on information transfer in 1968. After citing statistics from the Weinberg Report, they state that information services for technical literature must take special note of the report form because of the very important facts and data which such reports frequently contain.[12] There are

also some early indications that this awareness will be further born out by VINITI's very impressive new "World Scientific and Technical Literature," which is to be a seven volume annotated list of world serial literature in the sciences and technology, relating specifically to the materials abstracted in *Referativnyi Zhurnal.* Volume 1 has recently appeared, and it too takes note of technical report literature in its description of inclusions proposed for the new list. The introduction remarks that such publications are not only difficult to obtain regularly, but also that they present special difficulties in evaluation.[13] Examples of titles included in volume 1 that would be classed as report literature in our context are the *Technical Report* of NASA, and the *Report* of the Hydro- og Aerodynamisk Laboratorium (Hydro- and Aero-dynamics Laboratory. Aerodynamics Section) in Denmark. This new list stresses evaluation and appraisal as bases for inclusion; it will be instructive to see how many additional report titles are included in those volumes devoted to the literature of technology.

Surely, no one would deny that a fairly large percentage of technical reports is at best ephemeral and at worst wasteful. Interim reports, subcontract reports, preliminary reports, and progress reports may do more to clog avenues of communication than they do to open new prospects for inquiry or to resolve specific questions. Like some journal articles, nothing would have become them so much as obscurity.

What we desperately need is a national bibliographic effort, tied to one or more national depositories of technical reports, that can provide both control and access. One possibility might be a greatly improved *U.S. Government Research and Development Reports (USGRDR)* which is better than it used to be. Before 1968, its indexes were so meagre that they were compensated for with a motley set of special, non-governmental indexes.[14] The relatively low rate of use made of *USGRDR* as compared to *Nuclear Science Abstracts (NSA), Scientific and Technical Aerospace Reports (STAR)* and *Technical Abstract Bulletin (TAB)* is evident in a study titled *Diffusion of Abstracting and Indexing Services for Government-Sponsored Research.*[15] In the survey of recipients of these indexes, 96.8 percent of the respondents subscribed to only one copy of *USGRDR*, whereas they provided their personnel with multiple copies of *NSA*, *STAR*, and *TAB.* This suggests that a more comprehensive and better indexed abstract service than *USGRDR* has been in the past, or possibly that more discipline-oriented abstracts, would foster better use of technical reports. The improvements in *USGRDR's* 1968 indexes make the Clearinghouse's new "Selective Dissemination of Microfiche" a much more attractive acquisition possibility. But broad bibliographic coverage and economical accessibility is needed on a much wider base.

That adequate bibliography is of paramount importance is evidenced by the success of *Nuclear Science Abstracts* and the Atomic Energy Commission's depository program. Here a large body of report literature has had order imposed upon it; appropriate indexing approaches have been provided; publication data for reports assigned numbers but not so issued are noted; format and depository information serve to locate copies; and in addition a discipline-oriented abstract service has been incorporated into a

mission-oriented project. All in all, *Nuclear Science Abstracts* is an exemplary bibliographic service providing access to journal articles, translations, patents, books, and conference proceedings which have been evaluated for appropriateness to its purpose. In addition, *NSA* provides control over foreign and United States reports pertinent to work of the AEC. In 1964, it did this job for less than $600,000.[16] By 1970 this cost may be nearer one million dollars, but those who use *NSA* would surely think this money well spent. The AEC announced in July that its depository program could not be continued without cost to the participating libraries. An annual charge for the full set of microfiche will be approximately $1,650. Most depositories, I suspect, will feel that the set is well worth it, and their conclusion will rest in large measure on the bibliographic control which *Nuclear Science Abstracts* provides.

Similar efforts have already been made for the report literature of the National Aeronautics and Space Agency (NASA). The division of responsibility in this instance, between NASA for production of *Scientific and Technical Aerospace Reports (STAR)* and the American Institute of Aeronautics and Astronautics for production of *International Aerospace Abstracts (IAA),* has both advantages and disadvantages for discipline-oriented searches. Significantly, the legal charges of NASA and AEC have served to enable them to control the literature. Some agencies are directed by law to disseminate information; among these are the Atomic Energy Commission, the National Aeronautics and Space Agency, the Department of Agriculture, and the Weather Bureau. Other agencies, although their activities and accomplishments are, one hopes, equally intended for the common good, lack any comparable statutory directives. Among these is the Department of Defense (DOD). Although that department announces in *Technical Abstract Bulletin (TAB)* those reports which enter its Defense Documentation Center (DDC), it has been estimated that DDC receives only about 40 percent of the reports generated through DOD's research and development programs.[17] Moreover, *TAB* is not available to libraries which are not "qualified" recipients by virtue of their being involved in contract work with DOD. Even libraries which qualify must deny *TAB's* use to patrons who are not similarly qualified.

While we have no single comprehensive index to technical reports, and are perhaps not likely to have, we do have at least two mission-oriented abstracts providing good control of reports, and in both cases this is coupled with a depository program making the full report available fairly easily. In the Weinberg Report, the Atomic Energy Commission's Division of Technical Information Extension (DTIE) is termed a "delegated agent" for all documents and other forms of the literature that it interprets as being related to nuclear science. In this role it has responsibility for collecting, abstracting and disseminating the literature of its discipline. Its charges go beyond the report literature, to be sure, but the coverage it gives in *NSA* to report literature is worth emulating in other areas. The concept of "delegated agent" has been carried further in the study done by the System Development Corporation for the Committee on Scientific and Technical Information

(COSATI), Recommendations for National Document Handling Systems in Science and Technology[18] in which the investigators call for a "capping agency concept" together with a "responsible agent" concept. The capping agency would be provided by the establishment of a scientific and technical information bureau in the federal government's executive branch. It would be charged with determining the areas of information and documentation to be covered by departments and agencies. It would also have extensive responsibilities for formulating information policies, for implementing training programs, for budget control, and for establishing and encouraging us of information centers. Along with other responsibilities, it would assume a coordinating function for the various "responsible agents."

In terms of the COSATI report, these "responsible agents" might well be combinations of government and non-government agencies. In many cases, such a program would much increase some agencies' information acitivites and would charge them with preparation of specific information services. The agents would be responsible for assuring that reports resulting from federally performed research are published. They would also be charged with broad collection responsibilities for materials in their area, for translating, for abstracting, for announcing, and for dissemination. Still this is a more ambitious program than the present responsibilities of AEC and NASA, but even its partial implementation would do a great deal to resolve many of the library's difficulties with technical report literature. Few of us could now justify compiling finding lists and cross-reference files for what may be only modest holdings of technical reports.

At the same time, libraries with large collections in science and technology can be certain that they will be called upon to identify and to provide a good many technical reports. For most in the library field responsibilities here must be determined by a compromise between the economically feasible and as good an appraisal as they can make of the value of specific reports to the patrons they serve. If they feel that the responsibility for this kind of information and data transfer should rest with a governmental agency, or at least be funded by governmental support, they may quite properly decide that the extension of their own budget to cover this responsibility is done at the expense of more pressing needs. They should, however, be able to provide good service if the bibliography were adequate and if a national depository could provide documents with dispatch. If librarians do not have the documents in their own collections, this may mean a wait of a few hours or days. It is generally difficult for me to be convinced that this kind of delay, given the present technology of reproduction, is too serious for most users of technical reports to accomodate themselves to.

Decisions about acquisition of technical reports must necessarily be based on a careful evaluation of responsibility as compared to cost, bibliography, and individual library experience with specific requests. These will be hard decisions which each library must make on the basis of local factors. During the time that the National Science Foundation funded twelve regional depositories for technical reports, the general response indicated that use made of these reports through the depositories was not sufficiently great

to warrant continued support. However, local conditions were a large factor in the use made of those regional depositories. Those libraries which were located in the midst of heavy industrial complexes where a good deal of research was going on had considerable use and in some case have continued to keep their report centers going without National Science Foundation support. Others found that local funding could not be justified, especially in view of insufficient bibliographies.

There are more hopeful elements in the present outlook than there have ever been before. The development of specialized data centers—e.g., the Thermophysical Properties Research Center (Purdue); Defense Metals Information Center (Battelle); Hibernation Information Exchange (ONR, Chicago); Chemical Propulsion Information Agency (Johns Hopkins)—may help to curtail the preparation of some contract reports in their current form. Such published compilations of data as *Thermophysical Properties of High Temperature Solid Materials,*[19] could effect a great economy for all by obviating the need to issue the information in a multitude of separate reports.

It is apparent in several ways that high levels of the government are now concerned about the problems of the transfer of scientific information on a broad front. Last April the House of Representatives held hearings on a bill which proposes "a national science and research data processing and information retrieval system" (H.R. 8809). Among the witnesses was a representative of the System Development Corporation who had done the study for COSATI referred to above. Also among the witnesses was the chairman of the Committee on Scientific and Technical Communication (SATCOM), whose report for the National Academy of Sciences–National Academy of Engineering has recently been published.[20] This report also makes several significant comments and recommendations about the handling of technical reports. It has been sensitive to the need for a mechanism to facilitate interaction between government and non-government agencies and publishers. It has also noted the role of libraries in information transfer and has recommended the "management of *discipline-wide basic abstracting and indexing services* by appropriate scientific and technical societies and the management of other broad bibliographic services (e.g., title listings and citation indexes) by commercial organizations, national libraries, or societies, with support of these activities, when necessary, by the government agencies to whose operations they are relevant (Recommendation C1)."[21]

In its recommendations on "semiformal publications" it gives attention to the technical report and states that this kind of semiformal report should be subjected "somewhat selectively" to bibliographic control. And it defines bibliographic control for the purpose here as "orderly announcement and, in those cases that involve circulation of substantive information not scheduled for formal publication to a significant number of people, the provision of indexing, abstracting, and availability in a central depository."[22]

Especially significant from the library point of view is their request that government agencies sponsoring research and development clearly differentiate between substantive reports and those which are required by administrative and contractual needs. If this evaluation—in fact, a kind of refereeing—can be

accomplished, together with an orderly bibliographic approach, then the reports in general may become a properly compelling and economically feasible resource for library acquisition. When report literature is also subject to re-processing and re-packaging into significant reviews and comprehensive summaries, then there may be reason for a sanguine look at the future in this special segment of bibliography. We can hope, with Milton, that "Our torments also may in length of time/Become our elements."

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